REMARKS:

1) The specification and abstract have been amended editorially as shown above. The sub-headings in accordance with 37 C.F.R. §1.77 have been inserted into the specification. The abstract has been shortened. These amendments in the specification and abstract do not contain any new matter.

2) The originally filed claims and the original specification support the new claims approximately as follows.

New Claims	17	18	19	20	21	22	23	24
Original Support	Cl.1 + pg.12, last paragraph	Cl.2	Cl.3+1	Cl.4	Cl.5	Cl.6	Cl.7	Cl.8

New Claims	25	26	27	28	29	30	31
Original Support	Cl.9, (13)	Cl.10, (14)	Cl.11, (15)	Cl.12, (16)	Fig.6	Fig.6	pg.12,ln.17 to 20

New Claims 17 to 31 do not contain any new matter.

3) New claim 17 is additionally supported in the last paragraph on page 12 of the specification where reference is made to the fact that the heating conductor path (6) serves to compensate and to provide counter-heating for the heat flow to the sensor connection side (9). Claim 17 now emphasizes this compensation in the last two lines. Similarly, claim 31 is supported in the specification in the last paragraph on page 12 where it is said that the functional layer (4) is "lying thereover", namely the functional layer (4) lies over the heating conductor path (6).

It follows, that the heating conductor path (6) is positioned below the functional layer (4).

4) Applicants appreciate that the Examiner has examined all claims as expressed in section 1 on page 2 of the Office Action.

5) Referring to sections 2 and 3 on page 2 of the Office Action, the rejection of claims 1 to 18 and 13 to 16 under 35 U.S.C. §112, second paragraph is respectfully traversed for the following reasons. New claims 17 to 31 have been carefully drafted with due regard to the requirement of proper antecedent basis. The sensor tip is designated by reference number (10), for example in Figs. 1a and 1b. The function layer (4) is secured to a sensor carrier section that extends between the tip (10) and the conductor carrier section (9). These two sections, namely the sensor carrier section with its tip (10) and the conductor carrier section (9) are formed by the substrate (1). All claims have now been directed to a gas sensor for sensing a gas or gas composition or mixture at high temperatures. Withdrawal of the rejections under 35 U.S.C. §112, second paragraph is respectfully requested.

6) The invention is based on the recognition that an efficient and accurate detection of the presence of a gas or gas component in a gas composition at high temperatures depends on a uniform operating temperature of the gas sensor referred to in the present disclosure as the gas sensor function layer (4). The uniform heating of the sensor function layer (4) poses a problem because the heat dissipation from the sensor carrier section next

to the tip (10) of the substrate toward the conductor carrier section (9) is not uniform. Please refer in this connection to Fig. 2b which illustrates the above mentioned problem in conventional sensors. More specifically, Fig. 2b shows that various areas of the sensor carrier section have different temperatures which range, for example from 360°C at one point or area to 448°C at another point or area of the sensor carrier section and this of the sensor function layer (4).

7) The invention solves the above problem by the combination of features now more clearly set forth in independent claim 17 and claims 18 to 31 remaining depending under claim 17. More specifically the invention is realized in a gas sensor for sensing a gas or gas composition at high temperatures, wherein the gas sensor combines the following features: a substrate (1) having a sensor carrier section with a tip (10) and a conductor carrier section (9) connected to said sensor carrier section opposite said tip (10), a gas sensor function layer (4) supported by said sensor carrier section of said substrate (12) next to said tip (10), an electrical heater (6) supported by said sensor carrier section in a position for heating said gas sensor function layer (4), electrical conductors (2) supported on said conductor carrier section (9) of said substrate (1) and electrically connected to said electrical heater (6), said electrical heater (6) comprising heater sections having different heating resistance values which depend on a spacing between any particular heater section and said tip (10) of said sensor carrier section for generating a constant operating temperature throughout said gas sensor function layer (4) by compensating

varying heat dissipations by said substrate in said sensor carrier section.

8) A gas sensor as now more clearly defined in independent claim 17 and in dependent claims 18 to 31 is neither shown nor suggested by any of the references taken singly or in combination for the following reasons.

9) The rejection of claims 1 to 4 under 35 U.S.C. §102(b) as being anticipated by U. S. Patent 4,825,693 (Bohrer et al.) is respectfully traversed for the following reasons. The sensor device of Bohrer et al. discloses the meandering elements (22) and (24) as sensor elements and not as heating elements. Reference number (80) to which the Office Action refers and (88) merely refer to the edges of the sensor elements (22 and 24), please see the specification of Bohrer et al., col. 3, lines 6 to 10 and col. 8, lines 9 to 17. At the top of col. 3 Bohrer et al. say that the flow sensor comprises a pair of thin film heat sensors (22) and (24) supported by the diaphragm (32). The thin film heat sensors (22) and (24) are disposed on opposite sides of the heater (26). The heater (26) does not have any meandering configuration. This express disclosure of the Bohrer et al. specification does not support the Examiner's conclusion that Bohrer et al. have "partial resistance smaller in resistance at the tip where the arrow 113 points". A meandering heat sensor does not anticipate the now more clearly claimed use of a meandering heater element that generates heat in differentiated quantities at different locations along its extension so as to

compensate for different or differentiated heat dissipations in the area and volume of the gas sensing function layer according to the invention. Withdrawal of the rejection of claims 1 to 4 under 35 U.S.C. §102(b) is respectfully requested.

10) The rejection of claims 1 to 8 and 13 to 16 under 35 U.S.C. §102(b) as being anticipated by U. S. Patent 4,375,056 (Baxter et al.) is respectfully traversed for the following reasons. Baxter et al. discloses a thin film resistance thermometer that is constructed to have a desired or predetermined temperature coefficient. Thus, the resistance elements (16, 18, and 20) are heat sensors, not heat generators. The variation that Baxter et al. disclose in the configuration of the sensor elements (16, 18 and 20) are, for example, of full width for the sensor element (16) while the sensor elements (18) and (20) have a half width, please see the paragraph bridging cols. 3 and 4 of the Baxter et al. disclosure. These different thicknesses or widths of the sensor elements are for the purpose of calibrating the temperature sensor rather than heating. In fact, Baxter et al. do not disclose any heating elements. Therefore, the conclusions reached in section 6 of the Office Action are not supported by the Baxter disclosure. Withdrawal of this rejection of claims 1 to 8 and 13 to 16 under 35 U.S.C. §102(b) is respectfully requested.

11) The rejection of claims 1 to 8 and 13 to 16 as being anticipated under 35 U.S.C. §102(e) by U. S. Patent 6,437,681 (Wang et al.) is respectfully traversed because again Wang et al. disclose a

resistance heat sensor, please see for example col. 4, lines 24 to 27 where Wang et al. refer expressly to the measurement of high temperatures. Meandering configurations of heat sensors do not anticipate, much less suggest, specially configured heater elements that are dimensioned for the express purpose of delivering different heat quantities in different locations of the gas sensor element or function layer (4) for compensating different heat dissipations in these different locations as disclosed according to the invention. Withdrawal of the rejection in view of Wang et al. is respectfully requested.

12) The rejection of claims 1 to 8 under 35 U.S.C. §102(b) as being anticipated by U. S. Patent 5,656,987 (Kubota et al.) is respectfully traversed for the following reasons. Kubota et al. disclose a resistance temperature sensor which does not have a function layer for sensing the presence of a particular gas or gas component in a gas composition. A reference to be anticipatory must disclose all the claimed elements. Since Kubota et al. do not disclose a gas sensor element, Kubota et al. cannot anticipate the claimed invention. The Examiner correctly interpreted the Kubota et al. disclosure with regard to the uniform temperature distribution in a particular region of the high temperature sensor. However, Kubota et al's purpose is to increase the output of a resistance thermometer so that the temperature can be measured more accurately by preventing the indication of temperature changes that are merely due to different heat dissipations rather than to a temperature change to be measured. Such teaching of the Kubota et al. disclosure

does not anticipate the now more clearly claimed invention as defined in claims 17 to 31. Withdrawal of the rejection of claims 1 to 8 in view of Kubota et al. is respectfully requested.

13) The rejection of claims 1 to 4 and 13 to 16 under 35 U.S.C. §102(b) as being anticipated by U. S. Patent 4,345,465 (Gruner et al.) is respectfully traversed for the following reasons. Gruner et al. disclose a probe for measuring a flow rate and/or a temperature of a flowing medium. Sensing the presence of a gas or a gas component in a gas composition is not intended for the flow rate sensor. Further, the two different resistance patterns, namely resistors (4) and resistors (5) are grouped as temperature dependent resistors (4) and temperature independent resistors (5), please see col. 2, lines 47 to 51. Such a structure cannot anticipate the invention as now more clearly claimed in claims 17 to 31.

14) U. S. Patents 4,654,624 (Hagan et al.) and 4,719,441 (Horn) disclose a gas sensor and a sensor for measuring electrical conductivity respectively. However, the characterizing features that are now more clearly claimed in claims 17 to 31 are neither shown nor suggested by these references.

15) The remaining reference relate to temperature sensors and are thus not more relevant than the references discussed above as applied in the Office Action.

16) Withdrawal of all rejections and favorable consideration and allowance of the application, including all present claims 17 to 31 are respectfully requested.

Respectfully submitted,

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